GIS Integration and Development

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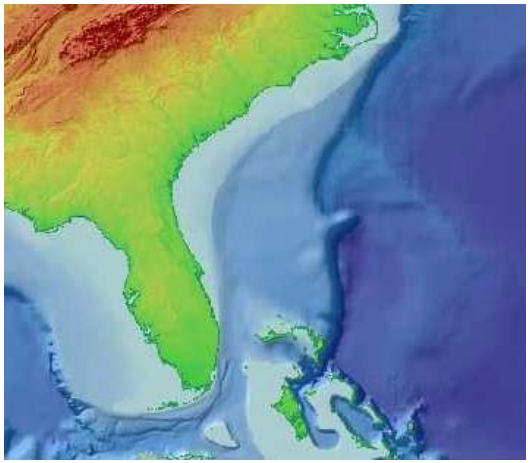
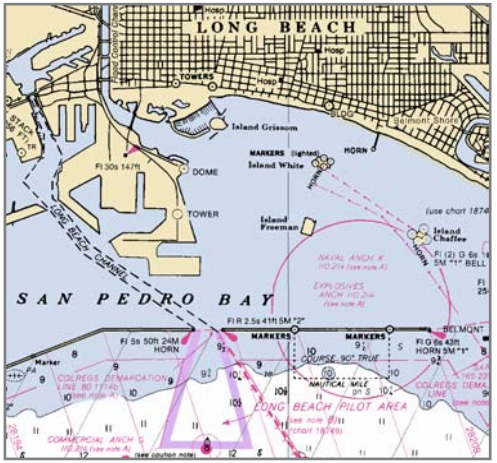
Program Manager

NOAA Coastal Services Center
LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

GIS Integration and Development

Providing relevant, easily accessible spatial data, tools, and support services





GIS Integration and Development

Primary Program Activities

- Spatial Data Development
- Tool Development and Database Integration
- Web Development and Support
- Technical Assistance and Training
- Education and Outreach

Project List for Next Fiscal Year

- Ocean Planning Information System
- Shoreline Data Development
- Pacific Islands GIS
- MPA Tools and Technical Assistance
- Alternatives for Coastal Development
- South Carolina Marsh Islands
- Enterprise GIS
- Coastal Ocean Observation
- Southern California Wetland Recovery Project
- International Coordination
- Lake St. Clair Watershed Characterization
- Coastal Landtrust Alliance
- Spatial Data Delivery System
- Dock Growth: Visualizing Alternatives to Balance Competing Interests
- N-SPECT Development
- Federal Geographic Data Committee (FGDC) Support
- Software and IT System Maintenance
- Broad Area Announcement Coordination
- Operations
- Center Web Support
- GIS Training and Outreach
- Coastal Hazards Outreach
- Coastal Storms Initiative - Risk and Vulnerability Assessment Tools
- Enhanced Flood Warning System - North Carolina Pilot
- Support to National Weather Service
- Storm Damage Assessment and Reporting Tool (SDART)
- FEMA National Hurricane Mitigation and Preparedness Program Support

Of the 27 total projects next year, 25 involve Center partners and 11 are joint projects with other Center programs

Staffing Profile

Current staffing

- 10 federal
  - 1 off-site in Silver Spring, MD
- 25 non-federal
  - 1 off-site in Silver Spring, MD

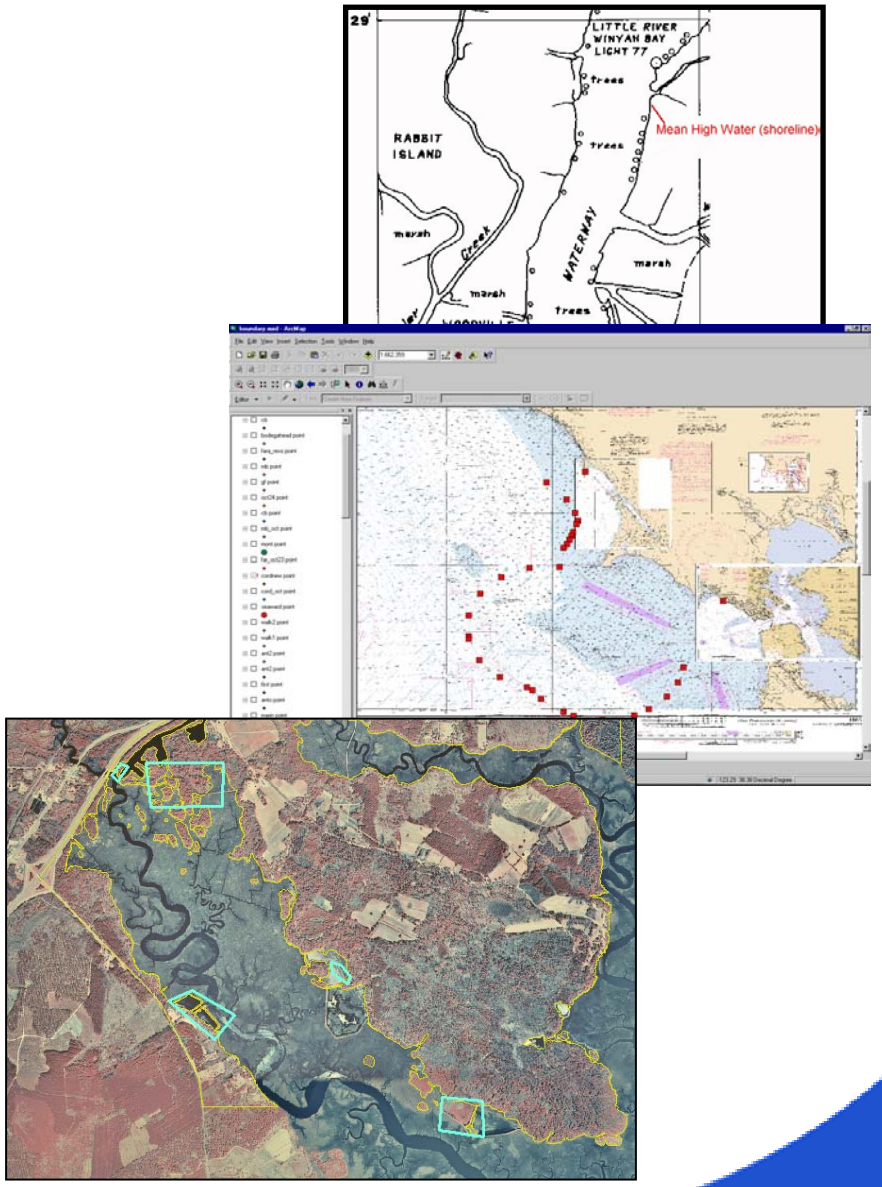
Variety of disciplines

- Spatial analysts, GIS programmers, computer programmers, database administrators, webmasters, web Developers, engineers, hazard specialists, planners, technology trainers, marine & coastal affairs specialists, and ecologists

Spatial Data Development

Data Development and Rescue

- Majority is data manipulation and project-based data development
- Shoreline Data Rescue
  - 14,000 original NOAA t-sheets and reports scanned
  - Converted approximately 7,500 t-sheets to GIS vectors (via off-site contractor)
- National Marine Sanctuary boundaries in digital format
- Data collection grants (primarily bathymetric data collection)



Federal Geographic Data Committee Support

- Working to advance the marine and coastal component of the National Spatial Data Infrastructure
- Providing leadership in coastal and ocean FGDC related activities through
  - Participation in the Standards Working Group, Marine and Coastal Spatial Data Subcommittee, and Marine Boundary Working Group
  - Participation in E-Gov Geospatial One-Stop Initiative
  - Standards Development
  - Metadata Workshops and Training
  - Clearinghouse Node Development

Key On-Site Contractor Roles

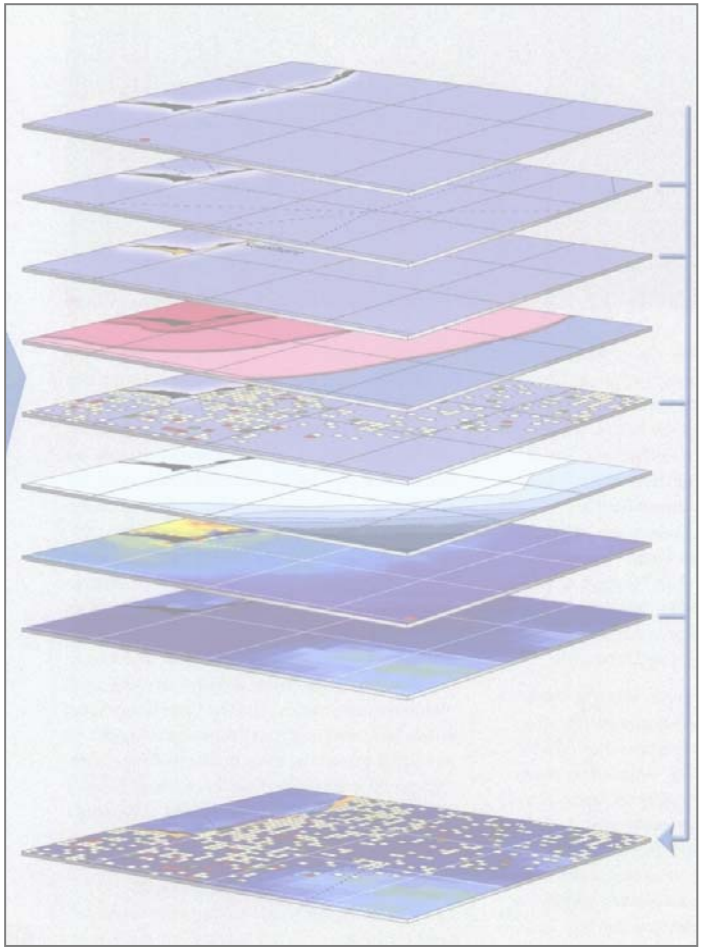
Spatial Data Development

- Technical project management
- Partner interaction and technical assistance
- Data development using standard GIS and remote sensing tools
- Quality assurance, review, and testing
- Data documentation and metadata development
- Staffing various committees and working groups

Tool Development and Database Integration

GIS Software Profile

- ESRI products are the principal GIS software applications used by the coastal resource management community (Center Survey)
- Primarily use ESRI software at the Center
  - ArcView 3.x and ArcGIS 8.x, including all extensions
  - ArcIMS and MapObjects Internet Map Servers
  - ArcSDE with SQL Server for DBMS
  - Avenue, MapObjects, and ArcObjects
  - Development in VB, VBScript, Java, JSP, ASP, and C++



Categories of Application Development

Three General Categories of Geospatial Application Development at the Center

Data Manipulation and Analysis

- Primarily extending the functionality of commercial of the shelf (COTS) GIS and remote sensing tools for enhanced manipulation and analysis of key coastal data sets

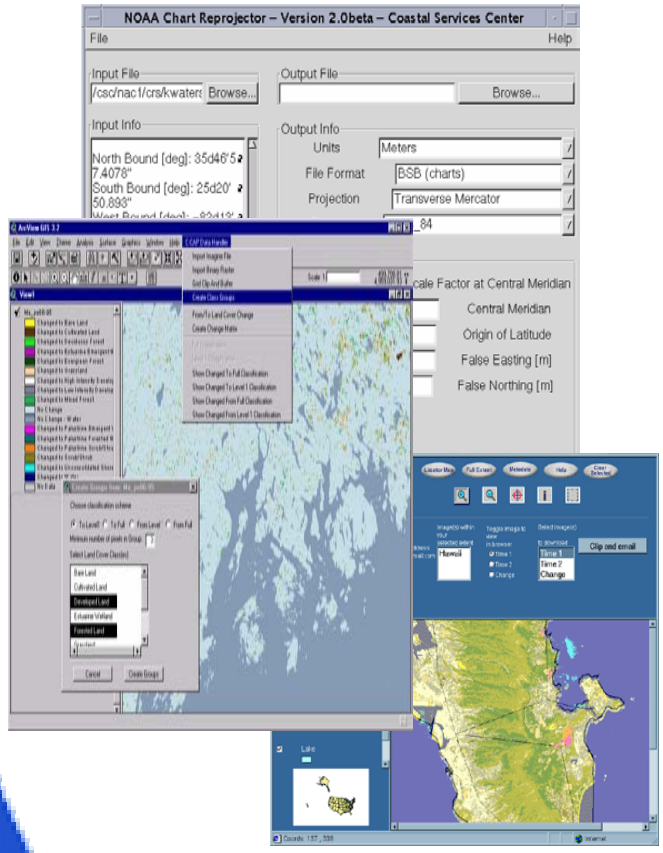
Data Access

- Typically Internet-based mapping and data portals providing direct access to key coastal data sets

Decision Support

- Primarily partnership-driven projects to develop enhanced spatial analysis and modeling tools within COTS GIS and remote sensing environments in both the desktop and Internet environments

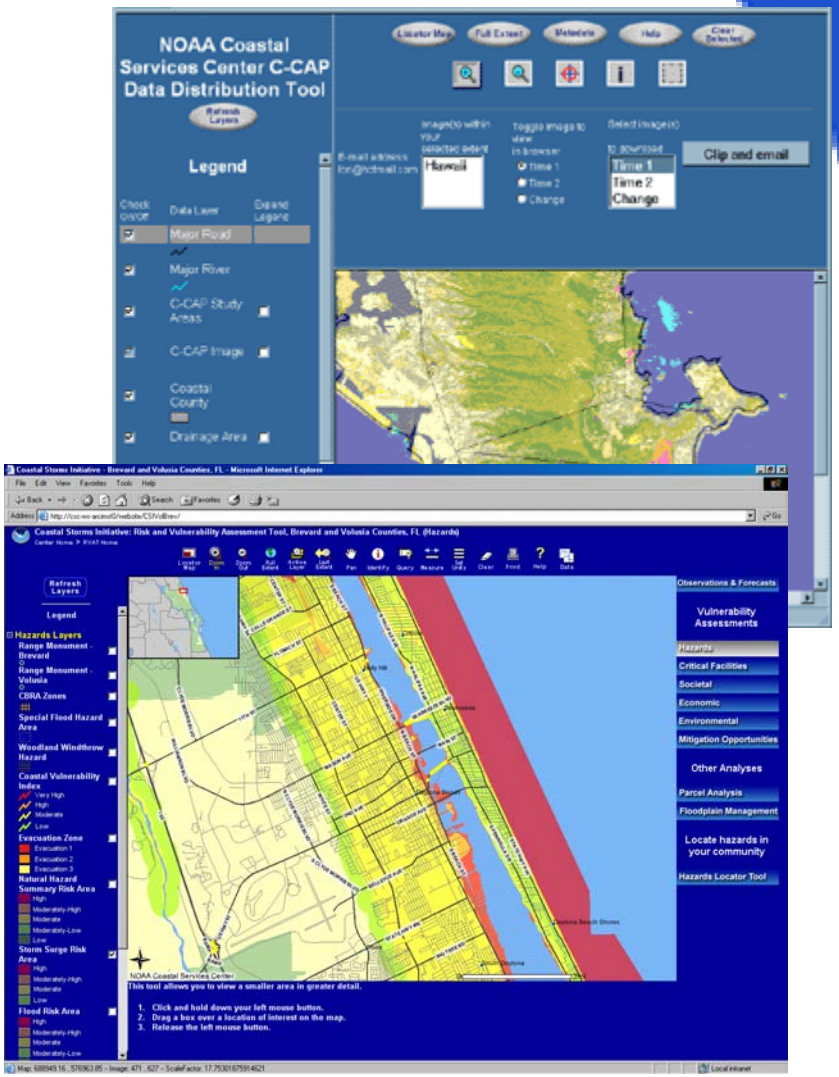
Data Manipulation and Analysis



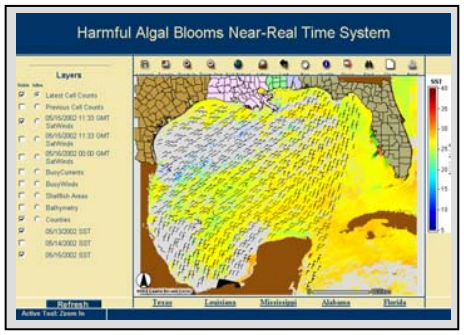
- ESRI Extensions
  - Enhance access and analysis for Center datasets
    - **C-CAP and LiDAR Data Handlers**
  - Provide access to NOAA datasets
    - **NOAA Chart and ENC Viewers**
  - Ease data documentation process
    - **Metadata Collector**
- Internet-Based Tools
  - LiDAR Data Retrieval Tool
  - C-CAP Data Distribution Tool
- Stand-Alone Applications
  - NOAA Chart Reprojector
  - MetaScribe

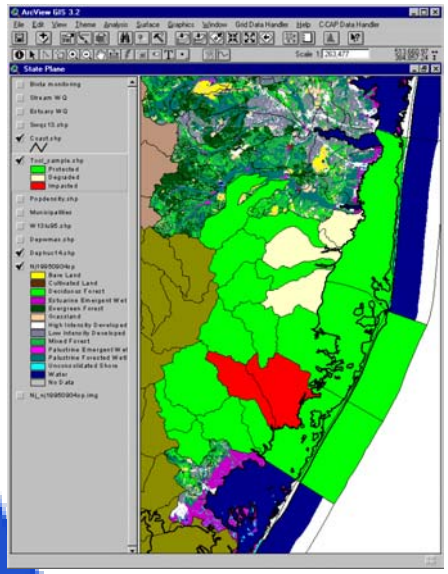
Data Access

- Increasing amount of focus at the Center on developing enhanced applications for the Internet
  - Primarily using ArcIMS with custom template and code base
  - Increasing the functionality of ArcIMS through ArcObjects, SDE, and other software tools and environments
- Existing Internet-based tools
  - LiDAR Data Retrieval Tool
  - C-CAP Data Access
  - Historical Hurricanes Mapping and Analysis Tool
  - Ocean Planning Information System
  - NOS Data Explorer



Decision Support





- Tools developed in close collaboration with Center partners to address specific coastal resource management issues
- ESRI Extensions
  - Dune Hazard Assessment
  - Impervious Surface Analysis
  - Nonpoint Source Pollution and Erosion
  - National Marine Sanctuary Speed Zone Analysis
  - Wetland Assessment
- Web-Based Tools
  - Harmful Algal Bloom Mapping System
  - Rhode Island Habitat Restoration Portal
- Stand-Alone Applications
  - Harmful Algal Bloom Bulletin System
  - Enhanced Flood Forecast System

Additional Programming & Database Support

- General and project-specific support provided to Center programs and coastal resource management community on both a planned and ad hoc basis
- Examples
  - Maintenance and enhancement to Center's annual planning and information request system
  - Design and maintenance of 18-computer product testing lab
  - Coordination with IT staff on maintenance and design of servers and training lab computers
  - Support for Center's Internet mapping sites and spatial databases
  - Support and maintenance of numerous business support IT systems

Key On-Site Contractor Roles

Tool Development and Database Integration

- Technical project management
- Partner interaction and technical assistance
- Software architect and design
- Software coding
- Software testing and documentation
- Quality assurance, review, and testing

Web Development and Support

Web Services

Center Webmaster Support

- Test for compliance with all appropriate Web standards and federal policies and directives
- Maintain “External Web Page Development” Standard Operating Procedure
- Check links, review HTML code, and maintain Web logs
- Maintain database that drives Center Web site

Web Design Support

- Create new Center Web site templates
- Provide support to other Center branches

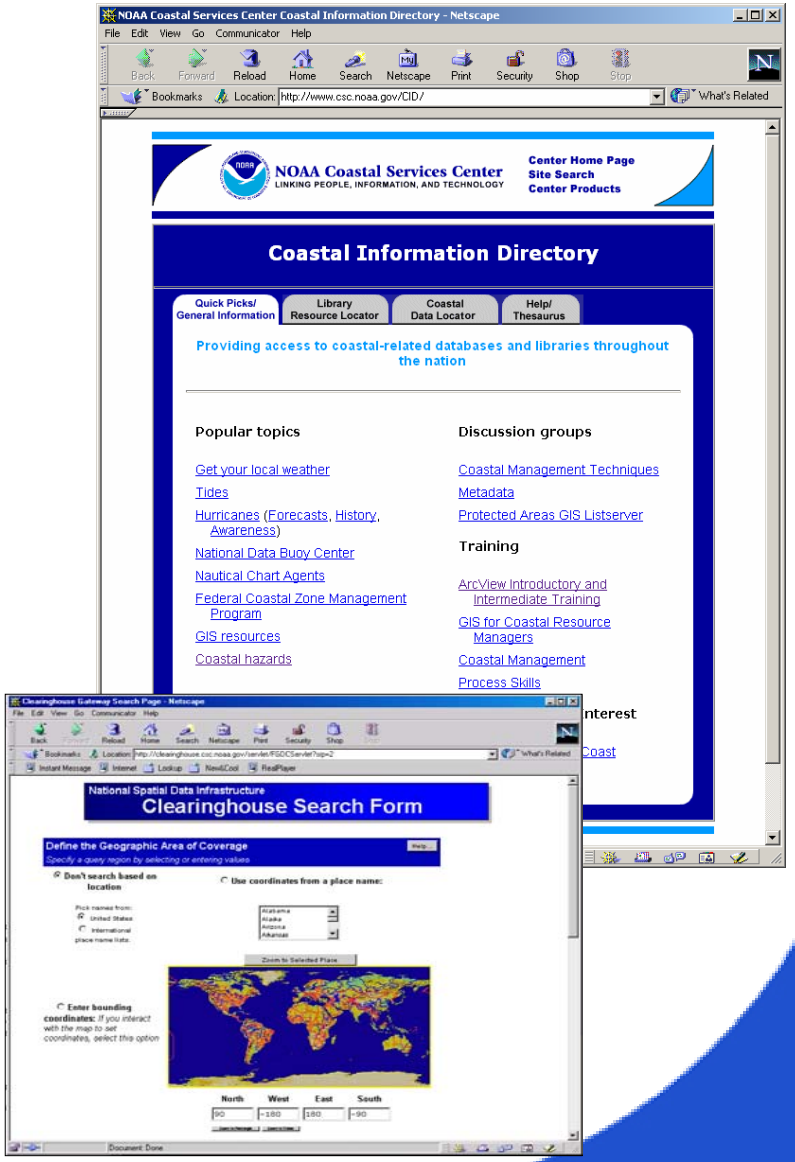
External Partner Support

- Provide technical support and host selected Center partner sites

Information Systems Support

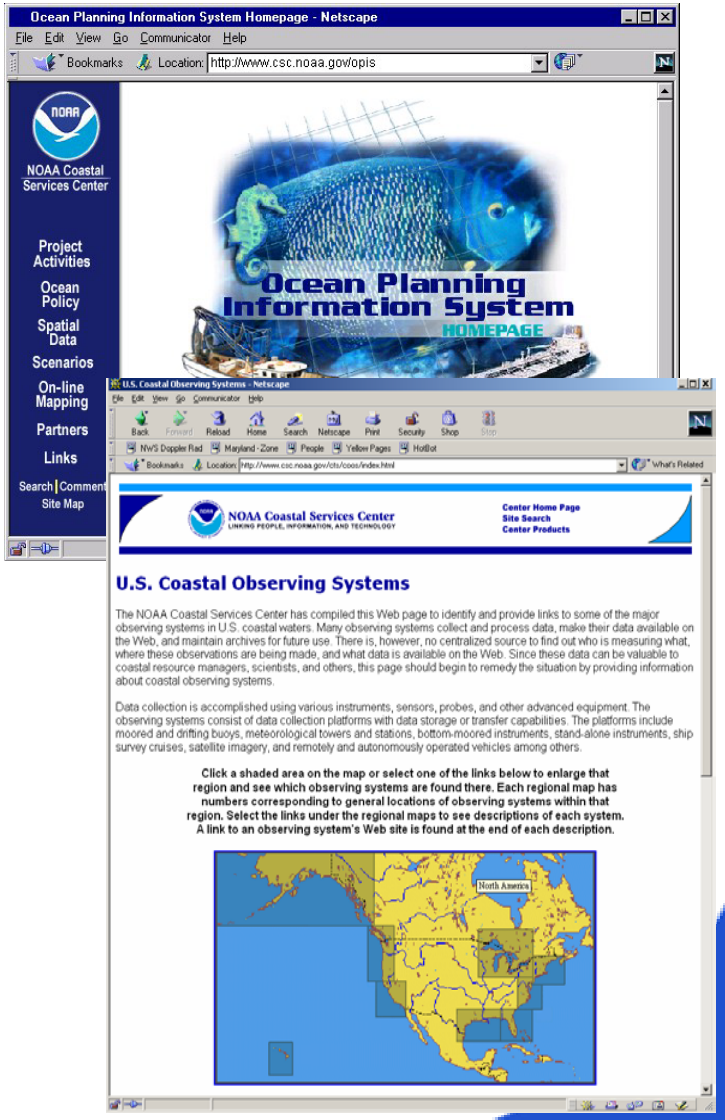
Develop and maintain a number of Internet-based information delivery sites

- Coastal Information Directory (CID)
- FGDC Clearinghouse Node and Gateway support
- NOAAServer coordination
- Coastal Metadata Forum
- Support digital library functions



Internet Sites for Coastal Management

- In partnership with coastal management community, develop Internet sites focused on specific issues of importance
- Activities include issue development, research, data development, HTML programming, and writing
- Examples
  - *Ocean Governance – Ocean Planning Information System*
  - *Ocean and Coastal Observations – U.S. Coastal Observing Systems*
  - *Coastal Hazards – Vulnerability Assessment Techniques and Applications*



Key On-Site Contractor Roles

Information Access and Delivery
and
Web Development and Support

- Technical project management
- Partner interaction and technical assistance
- HTML and XML coding
- Database management
- Research, writing, and graphics
- Quality assurance, review, and testing

Technical Assistance and Training
and
Education and Outreach

GIS Training and Outreach

- ESRI-Authorized Courses
  - Introduction to ArcView 3.3
  - Introduction to ArcGIS 8.2
- Center-Developed Courses
  - Intermediate ArcView 3.3
  - Coastal Applications Using ArcGIS 8.3
  - Introduction to Global Positioning Systems
  - Information Technology for Coastal Managers
  - GIS for Managers
- Train approximately 300 to 400 coastal resource professionals per year

Metadata Training and Technical Assistance

Services

- Metadata writing and review
- Workshops and presentations
- FGDC coordination
- NOS metadata specialist

Educational Materials

- Web page – “The Wonderful World of Coastal Metadata”
- Curriculum materials
- References, guides, and posters
- On-line course

Tools

- ArcView Metadata Collector
- MetaScribe
- XML tools

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Coastal Hazards and Marine Protected Areas Training

Coastal Hazard Planners and Emergency Managers

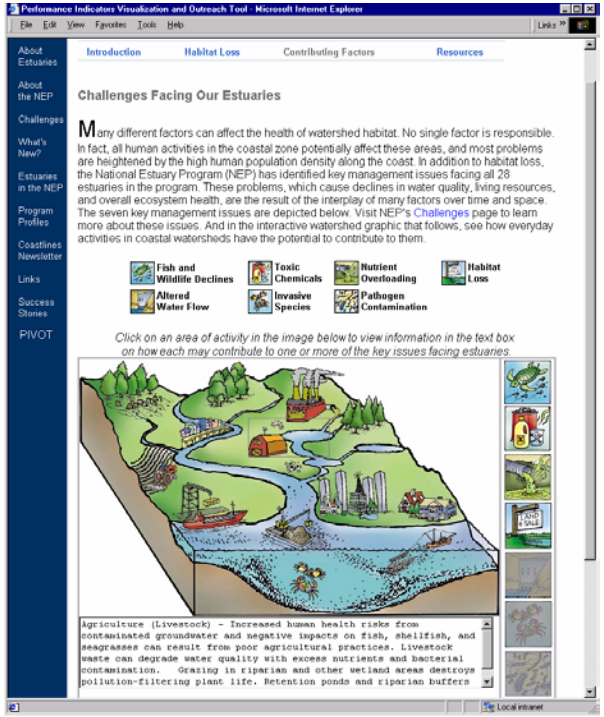
- Community Vulnerability Assessment Methodology Course
  - Interactive course to assess a community's risk and vulnerability to hazards
- Coastal Zone Management Role in Managing Hazards
  - Defines roles in hazard mitigation planning and the importance of partnerships in emergency planning

Marine Protected Area Managers

- Provide MPA community with technical and issue-based training and technical assistance

Capacity Building for Coastal Resource Management Community

- Partnering with coastal resource management community to enhance geospatial technology capabilities
- Support may include GIS hardware and software, networking infrastructure, data development, training, and application development
- Examples
  - Pacific Island coastal programs
  - National Estuarine Research Reserves and Marine Sanctuaries
  - Coastal Landtrusts
  - National Estuary Program



Education and Outreach

- CD-ROMs and Internet sites illustrating applied uses of spatial data
  - Submerged Aquatic Vegetation (SAV)
  - Applied remote sensing
  - Community Vulnerability Assessment Tool
- Publications
  - Marine Managed Areas Best Practices Handbook
  - Lessons Learned Regarding the Use of Spatial Data and Geographic Information Systems (GIS) During Hurricane Floyd
  - Special Issue of JCR on Shoreline Change
  - Shore and Sea Boundaries, Vol III

On-Site Contractor Roles

Technical Assistance and Training and Education and Outreach

- Technical project management
- Partner interaction and technical assistance
- GIS, Globabl Positioning Systems (GPS), metadata, and hazards training (onsite and offsite)
- Training curriculum development
- Writing and editing
- Data development and technical assistance
- Issue analysis
- Quality assurance, review, and testing

For More Information

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www.csc.noaa.gov/id/

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